Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Forward-Looking Mechanism	)	CC Docket No. 97-160
for High Cost Support for	)	
Non-Rural LECs	)	
	)	

Comments of the
Rural Utilities Service
on Customer Location

Introduction

The Rural Utilities Service (RUS) appreciates the opportunity to offer comment to the Commission on the issue of customer location in a Forward-Looking Mechanism for High Cost Support for Non–Rural LECs.

General

The difference in cost between urban and rural telecommunications systems is predominately due to the distance from wire center to customers, and to the distances between customers. For any model to calculate rural customer costs accurately, it must accurately predict where rural customers are with respect to the wire center and to each other. The current models do not know this because they use Census Block Groups (CBG) which are too large to correlate with rural exchange areas. In addition, since CBGs represent averaged information for large areas, they only vaguely define the customers' distances from the wire center, and they do not define the distances between customers. One of the model sponsors has recognized this, and is reworking its model to move to a higher level of resolution by using Census Blocks (CB).

While using CBs essentially solves the problem of defining distance from the wire center to the customer, it does not define the distance between rural customers. Model sponsors have proposed assumptions to fill in this crucial information, but the RUS knows that no single simple assumption will accurately represent the distribution of customers within a rural CB. Rural subscriber density is usually not uniform, even within a single CB.

Rural America is very diverse. Rural customers build their homes in every imaginable pattern. The rural outside plant designer has to accept this, and the proxy models must represent this or universal support will be insufficient. Rural customers may cluster in groups of twos or threes,

but this rural clustering is of little economic value to the modern loop designer who is trying to use electronic equipment based on 24 or 96 channel operation. It may seem incredible that some rural digital line concentrators only serve a few customers, or that rural loops can cost more than $10,000. The Local Exchange Carriers (LEC) have to serve these customers where they are; they don't get to make assumptions to limit those costs. The proxy models should not make unrealistic but economically convenient assumptions either.

The RUS offers specific comments in response to the Further Notice as follows:

Geographic Unit

Paragraph 40

To estimate the cost of distribution and feeder outside plant to serve customers, it is necessary first to know where customers are located. The early versions of the cost models estimated customer location based on CBGs. In many rural areas of LECs, CBGs are large compared to exchange areas and cannot be made to reasonably represent the characteristics of those areas. The model sponsors' assumptions about customer distribution within CBGs do not apply to all rural service areas. The Hatfield assumption that rural households cluster at a rate of 85% is incorrect for many RUS-financed rural LECs, and so is the BCPM assumption that households are always within 500 feet of a public road.

The need for assumptions is reduced as the accurate geographical representation of households is approached. The most accurate representation available today of rural households is at the Census Block (CB) level. Therefore, a model developed today should select the CB as its geographical unit, and the BCPM is moving to this higher level of resolution. According to representatives of the Bureau of the Census, however, by 1999, rural households will have been pinpointed geographically with respect to roads and landmarks, although at that time they will not be individually geocoded, and neither will all roads. With the availability of today's GPS equipment, it would be a simple matter for LECs to geocode all rural subscribers.

At present, the RUS proposes that models be capable of designing plant to the household locations defined by the geocodes of rural subscribers. The model may temporarily have to estimate household location and distribution using a geographical unit such as the CB, but in the near future actual household location will be available. Model design should not be driven by a temporary lack of data or alleged limitations in computing power.

In the meantime, CBs should be the geographical unit used to represent rural households. This is the highest level of census resolution, and any higher level such as small-scale uniform grids would be extrapolations from CB information. Census Blocks are small enough that errors in calculating the cost to serve will be significantly reduced in many cases. Also, CBs are bounded by roads and other physical landmarks, as are exchanges areas, so exchanges may be reasonably represented by an integral number of CBs and their boundaries will approximately match.

Customer Location

Paragraph 44

When a model is trying to guess the distribution of customers within the "black box" of a CB, it has to apply assumptions. None of the assumptions proposed to date should be adopted for all rural areas. Household distribution in rural areas is not uniform, even within an individual LEC service area. Hatfield's 85% clustering seems more appropriate in the native villages in Alaska than in typical rural areas. The BCPM's "within 500 feet of a [public] road" assumption is more generally valid in rural areas served by RUS borrower LECs, but this assumption fails in such diverse areas as southwestern Texas and eastern Tennessee. This assumption would be improved by including private roads.

Assumptions may have to be used until the resolution of models reaches the point of identifying the actual locations of rural customers. If assumptions are used, they should be user adjustable. LECs serving rural areas should be allowed to provide additional customer location data or should be allowed to select and adjust CB or service area clustering and proximity factors, possibly with the concurrence of their state commissions.

A final comment on this paragraph is a model should not be adopted if it attempts to calculate costs for rural service areas using CBGs. The CBG is not the best available data for rural customer location, and aggregation at this level cannot be made to resemble most rural exchanges.

Paragraph 46

The design technique suggested by the Commission in this paragraph is preferable to the synthetic plant design methods in the Hatfield model. The suggested technique appears to be similar to that currently proposed by the BCPM sponsors. Using modern telecommunications plant operating within its design parameters to serve actual customer locations is not a new idea.

The rural telecommunications plant designer starts with two incontrovertible constants: household location and road layout. Both are public information, although they may not yet be convenient for use by a computer model. But they will be in the near future. These two factors should dominate the calculation of cost-to-serve rural customers, but in the current models, they do not. Even the new BCPM will run plant along lines which are influenced by customer densities, rather than being governed by the road layout within the exchange. The result will be "as the crow flies" feeder and distribution routing, which will distort plant costs in rural areas.

Line Count

Paragraph 52

For rural areas, moving to at least the CB level of resolution should dramatically improve a model's ability to estimate exchange line count. The RUS agrees with the Commission that the previous models could not predict line count in rural areas, because they used CBGs which do not correlate with exchange boundaries and are very large compared to some rural exchange areas.

Although the new BCPM is not available for comparison, the RUS expects that it will do a much better job of predicting line count. Unless the Hatfield model graduates to the CB level of resolution, it will not accurately predict the line count of an exchange, or even a rural LEC service area. The Hatfield 3.1 model calculated the line count of a west Texas rural LEC to be under 436, when in fact it is known by RUS to be 964 as of December 31, 1996. Models which fail such a simple test, no matter how convenient to use, cannot be expected to predict costs accurately.

Conclusion

Models based on CBGs lack the resolution necessary to predict rural feeder and distribution plant costs. They cannot accurately predict line counts, so they also fail to predicting switching and other wire center costs. Only models using CBs as the smallest geographical unit should be considered for adoption until a more exact measure becomes available.

Actual customer location data is near, and the computing power to accommodate it is readily available if this level of resolution is used only for rural areas. Any model adopted should be able to switch to geocode customer location data for rural areas. When this level of resolution is reached, assumptions and the damage they cause will no longer be needed.

Road locations in rural areas govern the actual placement of plant, but in the models have little influence over the actual estimation of feeder and distribution plant. If this is rectified the models will more accurately predict costs.

The RUS appreciates this opportunity to comment.

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Administrator
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